COLORADO RIVER RECOVERY PROGRAM Project No.: 128
FY-2006-2007 PROPOSED SCOPE OF WORK

Lead Agency: Larval Fish Laboratory (LFL)

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Category:
__ Ongoing project
__ Ongoing-revised project
X Requested new project
__ Unsolicited proposal

Expected Funding Source:
x Annual funds
_ Capital funds
_ Other (explain)

I. Title of Proposal: **Abundance Estimates for Colorado pikeminnow in the Green River Basin, Utah and Colorado**

II. Relationship to RIPRAP:
Green River Action Plan: Mainstem
V. Monitor populations and habitat and conduct research to support recovery actions (Research, monitoring, and data management).
V.C. Population estimate for Colorado pikeminnow.
V.C.1. Middle Green River.

III. Study Background/Rationale and Hypotheses:

Background.—Abundance estimates of endangered Colorado pikeminnow *Ptychocheilus lucius* are needed to better monitor population status and provide benchmarks against which progress toward recovery can be measured. The 1998 meeting of the *Interagency Standardized Monitoring Program* (*ISMP*) workgroup recommended obtaining abundance estimates for each population of endangered fish. The Genetics Management Plan identified a population (the Yampa-Green stock) of Colorado pikeminnow that inhabits the middle Green River (Middle Green River reach) from Lodore Canyon downstream to approximately the White River. The middle Green River stock includes fish in the Yampa River (Yampa River reach) and the White River (White River reach); the few fish captured in the Duchesne River are included in the middle Green River reach. The other Green River stock resides in the mainstem Green River downstream of the White River. Two reaches include the Desolation-Gray Canyon portion of the Green River (Desolation-Gray Canyon reach) and the lower Green River (lower Green River reach) from about the town of Green River, Utah, downstream to the confluence of the Colorado River. This scope of work outlines a procedure to obtain abundance estimates for sub-adult (400 to 449 mm total length (TL)) and adult (> 450 mm TL) Colorado pikeminnow in each of the five reaches of the Green River Basin, Colorado and Utah, as described above. From those reach estimates, an abundance estimate for each length-based life stage will be estimated for the entire Green River Basin.

Catch/effort data that describes abundance of sub-adult /adult Colorado pikeminnow have been collected in the Colorado (three reaches), Green (five reaches), Yampa (three reaches), and White (two reaches) rivers from1986 to 2000 under the auspices of the *ISMP*. Abundance estimates based on capture-recapture sampling were made from 2000-2003 in the middle Green River and from 2001 to 2003 in the lower Green River. Collectively, these data suggested increased abundance of Colorado pikeminnow in the Green River Basin until 2000 but abundance estimates indicated an apparent decline after that (Bestgen et al. 2005 draft). Recovery goals call for sampling on a three year on, two year off schedule and abundance estimates for the Green River population are due again from 2006 to 2008. Therefore, this proposal outlines procedures to conduct capture-recapture sampling similar to that conducted from 2000 to 2003 using uniquely marked animals so that the necessary abundance estimates can be calculated.

Parameter estimation models and assumptions.—Two general classes of models can be used to estimate abundance of animal populations in the wild and are differentiated based on

assumptions about population demographics. The first class of models are closed population estimators. Closed population estimators have three main assumptions. The first is that the population is closed so that N, the true population size, is constant during the short-term annual sampling event. Geographic closure assumes that there is no immigration to or emigration from the population of interest. Demographic closure assumes no births or deaths within the sampling period. A second assumption that is often difficult to meet is that all individuals in the population have the same probability of being captured during each sampling occasion. Differences in capture probability among individuals are well-known in fish populations, often involving size related differences in susceptibility to the sampling gear. Another situation that may cause unequal probability of capture is a group of individuals that occupy a habitat type different than that used by most individuals in the population. Behavioral differences may also cause differences in capture probability among individuals. Capture probabilities may also vary among capture occasions because of changes in environmental conditions such as stream flow. A third assumption of closed abundance estimators is that previously marked animals can be reliably distinguished from unmarked animals.

The second class of models are open population estimators. Open population models are useful to estimate population abundance as well as the joint probability of survival/immigration, and births or recruitment/emigration (Burnham et al. 1987, Lebreton et al. 1992). This general model class is termed the Jolly-Seber (J-S) model (Jolly 1965, Seber 1965). Similar to closed population models, J-S population estimation models assume that tagged fish are representative of the population to which inferences are being made and that the fate of individuals is independent of each other. An assumption not common with closed abundance estimators is that fish in an identifiable class or group (e.g., adults) have the same survival and capture probabilities for each time interval. A consequence of this component in J-S population models is that all releases should be made within a short time period so that rates among individuals are the same. The J-S models do not generally require assumptions of no immigration/emigration, and no recruitment or mortality. An exception is that geographic closure is still important when population size is the parameter of interest. Although open models can estimate more and different parameters and have less restrictive underlying assumptions, abundance estimates generated from such models are often less precise than those for closed population models. Another disadvantage of abundance estimates calculated from open population models is that they are all based on model M_t, a model that allows for time varying probabilities of capture. Although time variation is likely among sampling occasions, J-S models assume no heterogeneity or behavioral response among individuals in the estimated population. Thus, abundance estimates calculated from open population models do not allow as thorough an evaluation of assumptions as do closed population models.

Robust design for capture-recapture studies.—The robust design attempts to capitalize on the strengths of closed and open population models by combining the use of each in an overall sampling and estimation program (Pollock 1982, 1990). The robust design employs sampling at two scales. Sampling occasions completed at closely spaced intervals (e.g. weeks) are used to estimate population size using closed population models. That level of sampling completed in two or more consecutive years allows for estimation of population probabilities of capture, recruitment, and annual survival rates. The robust design approach was employed by Osmundson and Burnham (1998) and Bestgen et al. (2005 draft) to estimate abundance and survival rate of Colorado pikeminnow in the Colorado River and the Green River, respectively. This approach offers advantages of both closed and open population estimation methods if certain assumptions are met. A particular advantage is that the robust design allows evaluation of heterogeneity effects within individuals among capture occasions. We can meet the requirements of the robust study design with the approach described below.

IV. Study Goals, Objectives, End Product:

Goals: Obtain an accurate (unbiased) and reliable (precise) estimate of the adult population abundance and survival of Colorado pikeminnow that occupy the Green River study area.

Objectives:

1. Complete a minimum of three sampling passes through the five Green River Basin reaches listed to capture sub-adult and adult Colorado pikeminnow:

   a) Green River between the confluence of the White River upstream to the lower end of Whirlpool Canyon (i.e., upper Rainbow Park).

   b) White River between the confluence of the Green River upstream to Taylor Draw Dam,

   c) Yampa River between Deerlodge Park and Craig, excluding Cross Mountain Canyon,

   d) Green River from the White River confluence downstream to near Green River, Utah, and,

   e) Green River from downstream of Green River, Utah, to the confluence with the Colorado River.

   The LFL and CDOW will attempt up to six sampling passes in the Yampa River, in part associated with bass and northern pike removal projects, in order to obtain a more precise and accurate Colorado pikeminnow abundance estimate.

2. Obtain highest possible rates of capture of Colorado pikeminnow within concentration habitats and maximize number of individuals marked and captured on each sampling occasion.

3. Obtain estimates of probability of capture and abundance for Colorado pikeminnow in each of the five reach and for the entire study area.

End Product: The end products are abundance and survival estimates for sub-adult and adult Colorado pikeminnow for each of the White, Yampa, and Green River populations. An overall estimate will also be calculated.

Report Review schedule: Annual reports will be submitted each year. A final summary report will be submitted to the Recovery Program Coordinator 31 Dec. 2008, to peer review 31 Jan. 2009, 31 March 2009 to Biology Committee, 15 June 2009 final report ready.

The report will include:

1. Abundance estimates for all reaches and the entire basin for all three years.
2. A summary of sampling effort and discussion of issues related to sampling efficiency.
3. A list of PIT tagged fish will be submitted to the database manager at the end of each year.
4. Depending on the wishes of the Biology Committee and the Recovery Program, other parameter estimates such as survival rates and population rates of change may be estimated.

V. Study Area

The primary study sites will include the Green River from Rainbow Park downstream to the Colorado River confluence and the major tributaries of the Green River including the Yampa River from Craig to Deerlodge Park, the White River from Taylor Draw Dam to the Green River confluence, and the lower Duchesne River when accessible. Because capture data indicate that Yampa Canyon, Lodore Canyon, Whirlpool Canyon, and Split Mountain Canyon generally contain fewer Colorado pikeminnow than the alluvial reaches, canyons will not be sampled (Bestgen et al, 2005 draft). The Vernal Field Station of the U. S. Fish and Wildlife Service will be responsible for sampling the White River, and the Desolation-Gray Canyon reach of the Green River, Utah Division of Wildlife Resources, Vernal, will be responsible for sampling the middle Green River reach, Utah Division of Wildlife Resources, Moab, will be responsible for sampling the lower Green River reach. Colorado State University and the Colorado Division of Wildlife will share responsibility for sampling the Yampa River upstream of Dinosaur National Monument; details of sampling responsibility need to be discussed yet.

VI. Study Methods/Approach

We propose to conduct abundance estimation for sub-adult and adult life stages of Colorado pikeminnow in the Green, White, and Yampa rivers as outlined in the Study Area description. Investigators will thoroughly sample habitat where Colorado pikeminnow are known to congregate (concentration habitat) in each reach on three separate, consecutive occasions (passes) during springtime beginning just after ice-off and ending prior to or during runoff. Concentration habitats are usually shorelines, eddies, pools, flooded tributary mouths, and backwaters. This approach will permit annual abundance estimate calculations for populations by reach and also allows for a combined estimate for the study area. This sampling program conducted over a three-year period will fulfill the requirements of the robust design and also permit calculation of survival estimates for pikeminnow in the study area.

Annual sampling to estimate pikeminnow abundance.—Annual sampling will involve a minimum of three sampling occasions through the five river reaches identified above. The three sampling occasions will be conducted in spring between the time when ice off occurs and end prior to or during spring runoff before pikeminnow migration begins. Sampling will begin at the top of each major reach and proceed downstream. It is important to maximize the number of fish captured on each pass (Lebreton et al. 1992). Different gear types may be used in different sampling areas. Electrofishing will be the primary gear in main channel and small backwaters. Large backwaters and concentration areas may be sampled with a blocking trammel net and perhaps electrofishing. Gear use depends on habitat availability as well but will be applied as

consistently as possible across reaches and rivers. The goal of using different gear types is to maximize capture probability on each pass.

Investigators will proceed downriver, sampling all available Colorado pikeminnow concentration habitat on each pass. Information recorded at each Colorado pikeminnow capture location will be major habitat type (e.g., main channel pool, main channel eddy, backwater, flooded tributary mouth), a specific capture and release location identified by a GPS unit, and fish total length and mass. Each fish will be scanned for the presence of a PIT tag, making sure to follow standard Program protocols to ensure detection of tags with new and old frequencies. The fish will be tagged if it has not been previously marked, and the tag number recorded. The importance of back-up PIT tag scanners of both frequencies and adequate tagging supplies is critical to the success of this project. Scanning and tagging of all fish will reduce bias and result in the most accurate and precise abundance estimates possible. Tagged fish will be released in recovered condition at the point of capture.

After a single marking occasion is completed for the reach, they will proceed back to the upstream terminus and begin the second sampling occasion. A sufficient amount of time (e.g., 5-10 days) should elapse between the start of consecutive sampling occasions to allow for sufficient mixing of marked and unmarked fish. In the appropriate reaches, an *ISMP*-like sampling pass may be conducted within a primary sampling occasion to add to that data set.

Assumptions of closed population abundance estimators.—Fulfilling the assumptions underlying any abundance estimation model is a critical first step in the planning of a large field study. We have evaluated the assumptions of closed population abundance estimators in a previous study and feel confident that these assumptions can be met again (Bestgen et al. 2005 draft). The first assumption, that of constant N during short-term annual sampling, can be assumed because the size of the study area dictates that the only point of emigration/immigration from the population of interest would be to or from the lower Green River. The likelihood of movement is much reduced at that time of year because fish occupy small and stable home ranges. Lack of movement during that time period will also reduce movement of fish within the main study area from sampled reaches to areas that may receive little or no sampling effort such as canyons. Limiting the target group of fish to sub-adult and adult pikeminnow and limiting sampling to a relatively short time period in spring prior to migration, eliminates the possibility of additions to the population through recruitment. This fulfills the assumption of demographic closure.

The second assumption of equal probability of capture of individuals is unlikely to be met except in all but the most restricted conditions. However, techniques can be employed to reduce effects of heterogeneity among capture probabilities of individuals (e.g. size effects). Variation among capture probabilities among reaches and years can be reduced by explicitly modeling time effects. We also utilized total length as a covariate in previous analyses to account for a proportion of capture heterogeneity due to fish size differences (Bestgen et al. (2005 draft). Previous studies have shown that behavior effects such as avoidance of capture gear are not generally important (Bestgen et al 2005). An exception may be for Colorado pikeminnow 800-mm TL or larger, which had very low recapture rates among years. The low number of those fish in samples suggested that bias of abundance estimates due to presumed behavior effects of those larger fish should be low. A separate study may be necessary to fully understand if those behavior effects are important, or if low recapture rates of large Colorado pikeminnow are due to other factors.

Another assumption is of accurate recognition of marked and unmarked animals. To ensure that this assumption is fulfilled, investigators need to make sure tag detection equipment is in good operating order, carefully scan each fish with old and new types of tag scanners, and

make sure tags are detectable prior to insertion. This requires that the tagging protocol be diligently followed.

Study duration.—The robust design requires at least two years of data collection in order for a survival estimate to be calculated, but the addition of more years will increase the number of estimates possible, and their accuracy and precision. Although survival estimation is not a main goal of this study, such estimates are useful for other purposes related to determining recovery goals and for comparison with survival rates of Colorado pikeminnow in other systems or periods (Osmundson and Burnham 1998, Bestgen et al. 2005 draft). A minimum of three years of data will also yield three separate abundance estimates for pikeminnow in the study area, and will provide a consistency check for estimates among years.

Other considerations for FY 2006 and 2007.—This sampling design does not include canyon reaches because fish are presumed rare in those habitats during the non-spawning period (Bestgen et al. 2005 draft). Another consideration in the decision not to intensively sample canyon reaches is the high level of logistics and effort needed to accomplish such sampling. We will use ancillary data collected in those reaches, such as was done from 2000 to 2003, to evaluate that this consideration still holds (Bestgen et al. 2005 draft).

Program Mark will be used to estimate abundance and survival estimates for Colorado pikeminnow in the study area. Program Mark is an omnibus data analysis program that allows exploration of a number of closed and open sampling design estimators for calculating estimates of abundance and survival. The robust design specifically incorporates closed model abundance estimation techniques, while survival is estimated from variants of the Jolly-Seber model.

VII. Task Description and Schedule (FY-2006)

Because of the complexity and short duration of the sampling design, and the need to use five relatively autonomous units to complete this work, we will continue to use a Standard Operating Procedure for field personnel to ensure a consistent sampling approach and timely completion of tasks. We will also have frequent conference calls with team members and field crews to discuss issues and problems. This will also provide an opportunity for each group to report on progress in completing tasks. The Larval Fish Laboratory will be responsible for routine coordination of the study. The Program Directors office will assist in resolution of problems related to timely completion of tasks.

Task 1. Feb.-March. Order and prepare equipment. This task relates to objectives 1 and 2.

Task 2. April. Scout locations, final equipment preparation. This task relates to objectives 1, 2, and 3. Several river reaches are relatively remote or on private property and will require reconnaissance to acquire permission and find boat launch and take-out sites.

Task 3. Apr.-June. 3-pass sampling. Relates to objectives 1-3.

Task 4. Jan.-Sept. Sampling team coordination, data entry, and analysis. Relates to 4 objectives 1-4.

Task 5. December. Write Recovery Program summary report. Relates to objectives 3 and 4.

Task Description and Schedule (FY-2006)

Task 1. Feb.-March. Literature research, order and prepare equipment, refine standard protocol for field crews.

Task 2. April. Scout locations, final equipment preparation.

Task 3. Apr.-June. 3-pass sampling.

Task 4. Jan.-Sept. Sampling team coordination, data entry, and analysis.
Task 5. November. Write Recovery Program summary report.

VIII. FY-2006 Work

- Deliverables/Due Dates. Project summary report November 2006.

		Costs per year	
Group/Agency	Reach	FY-06	FY-07
Larval Fish Laboratory	Yampa River	55,331	56,616
Utah Division of Wildlife Resources, Vernal	middle Green River	51,667	53,129
U. S. Fish and Wildlidfe Service, Vernal	White River	53,611	54,500
U. S. Fish and Wildlidfe Service, Vernal	Desolatio-Gray Canyon, Green River	64,679	65,898
Utah Division of Wildlife Resources, Moab	lower Green River	112,706	115,568
	total	337,873	345,711

Budget by reach:

Yampa River, Larval Fish Laboratory

Larval Fish Laboratory: Budget includes data analysis costs for Principal investigator. Budget presented assumes that ½ of field-related expenses associated with Colorado pikeminnow abundance estimation will be covered under project 125, pike and smallmouth bass removal in the middle Yampa River and under CDOW sampling. Additional funds are to be used to attempt five or six full passes (at present three complete passes and sampling in concentration areas three more times will be completed under existing CDOW and CSU projects) for the Yampa River to improve precision of abundance estimates. Cost savings over a combined budget for middle and lower Green River projects pro-rated from 2003 to 2006 ($75,200 in 2003, $82,173 projected in 2006, 2006 actual = $55210) represent $26,963. Fringe benefits are 20.8% of the total amount of salaries. LFL overhead rate is 17.5% under the Cooperative Ecosystem Studies (CESU) umbrella and is charged to all items except equipment in excess of $5,000. Fringe on salary and overhead are figured into costs for LFL items.

Larval Fish Laboratory, FY2006							
Tasks 1 and 2, Prepare sampling equipment, literature work, site visit							
Item					Cost		
Labor	Units	Cost/unit					
Principal investigator (d)	8	425			$3,400		

Biologist (d)	5	310			$1,550		
Senior technician (d)	7	176			$1,232		
Technician (d)	7	140			$980		
				subtotal	$7,162		
Travel							
Per diem (d)	4	30			$120		
Mileage (miles)	750	0.37			$278		
				subtotal	$398		
				Total	$7,560		
Task 3, complete 3 sampling passes, 10d ea, represents 1/2 the costs, other 1/2							
covered by project 125, pike and bass removal in the middle Yampa River							
Item					Cost		
Labor	Units	Cost/unit					
Principal investigator (d)	10	425			$4,250		
Biologist (d)	15	310			$4,650		
Senior technician (d)	15	176			$2,640		
Technician (d)	60	140			$8,400		
				subtotal	$19,940		
Travel							
Per diem (d)	100	20			$2,000		
Mileage (miles)	3600	0.37			$1,332		
				subtotal	$3,332		
Supplies							
gas	450	2.25			$1,013		
oil	20	2.5			$50		
motor repair	2	300			$600		
nets, seines, pens	9	52			$468		
preservative	1	33			33		
misc camp gear	1	400			400		
Misc sampling gear	1	400			400		
				subtotal	$2,964		
				Total	$26,236		
Task 4, data entry and analysis							
Item					Cost		
Labor	Units	Cost/unit					
Principal investigator (d)	25	425			$10,625		
Biologist (d)	3	310			$930		
Senior technician (d)	20	176			$3,520		
Technician (d)	5	140			$700		
				subtotal	$15,775		

Task 5, annual report preparation							
Item					Cost		
Labor	Units	Cost/unit					
Principal investigator (d)	10	425			$4,250		
Biologist (d)	3	310			$930		
Senior technician (d)	5	176			$880		
Technician (d)	5	140			$700		
				subtotal	$6,760		
Travel							
Annual mtg	2	500			$1,000		
				subtotal	$1,000		
				Total	$7,760		
			Total tasks 1-5		$57,331		
Larval Fish Laboratory, FY2007							
Tasks 1 and 2, Prepare sampling equipment, literature work, site visit							
Item					Cost		
Labor	Units	Cost/unit					
Principal investigator (d)	7	438			$3,066		
Biologist (d)	5	319			$1,595		
Senior technician (d)	7	181			$1,267		
Technician (d)	7	144			$1,008		
				subtotal	$6,936		
Travel							
Per diem (d)	4	30			$120		
Mileage (miles)	750	0.37			$278		
				subtotal	$398		
				Total	$7,214		
Task 3, complete 3 sampling passes, 10d ea							

Item					Cost		
Labor	Units	Cost/unit					
Principal investigator (d)	10	438			$4,380		
Biologist (d)	15	319			$4,785		
Senior technician (d)	15	181			$2,715		
Technician (d)	60	144			$8,640		
				subtotal	$20,520		
Travel							
Per diem (d)	100	21			$2,100		
Mileage (miles)	3600	0.38			$1,368		
				subtotal	$3,468		
Supplies							
gas	450	2.25			$1,013		
oil	20	2.5			$50		
motor repair	2	400			$800		
nets, seines, pens	9	60			$540		
preservative	1	33			33		
misc camp gear	1	420			420		
Misc sampling gear	1	420			420		
				subtotal	$3,276		
				Total	$25,164		
Task 4, data entry and analysis							
Item					Cost		
Labor	Units	Cost/unit					
Principal investigator (d)	25	438			$10,950		
Biologist (d)	3	319			$957		
Senior technician (d)	20	181			$3,620		
Technician (d)	5	144			$720		
				subtotal	$16,247		
Task 5, annual report preparation							
Item					Cost		
Labor	Units	Cost/unit					
Principal investigator (d)	10	438			$4,380		
Biologist (d)	3	319			$957		
Senior technician (d)	5	181			$905		
Technician (d)	5	144			$720		
				subtotal	$6,962		
Travel							
Annual mtg	2	515			$1,030		
				subtotal	$1,030		

				Total	$7,992		
			Total tasks 1-5		$56,616		

middle Green River, Utah Division of Wildlife Resources, Vernal

Task 1. Literature research, order and Prepare equipment.

FY06 Task 1		
Labor-	Work days	Cost
Project Leader (438/day)	1	$438
Biologist (340/day)	4	$1,360
Technician (195/day)	5	$975
FY06 Task 1 Subtotal		$2,773

Task 2. Scout locations, final equipment preparation.

FY06 Task 2		
Labor-	Work days	Cost
Project Leader (438/day)	4	$1,752
Biologist (340/day)	4	$1,360
Technician (195/day)	4	$780
Travel		
Vehicle ($36/day; mileage and rent) [a]	4	$144
Equipment (maintenance or replacement)[b]		$1,000
FY06 Task 2 Subtotal		$5,036

[a] Calculated as average miles traveled per day * cost per mile + daily rental fee = 75 * $0.41 + $5 = $35.75/day.

[b] Includes repair or replacement of outboard motor lower units, electrofishing, and trammel net repair and replacement.

Task 3. 3-pass sampling.

FY06 Task 3		
Labor-	Work days	Cost
Project Leader (438/day)	10	$4,380
Biologist (340/day)	40	$13,600
Technician (195/day)	80	$15,600
Travel		
Vehicle ($36/day; mileage and rent)[a]	20	$720
Equipment (maintenance or replacement)[b]		$1,000
FY06 Task 3 Subtotal		$35,300

[a] Calculated as average miles traveled per day * cost per mile + daily rental fee = 75 * $0.41 + $5 = $35.75/day.

[b] Includes repair or replacement of outboard motor lower units, electrofishing, and trammel net repair and replacement.

Task. 4 Sampling team coordination, data entry and analysis.

FY06 Task 4		
Labor-	Work days	Cost
Project Leader (438/day)	5	$2,190
Biologist (340/day)	3	$1,020
Technician (195/day)		$0
FY06 Task 4 Subtotal		$3,210

Task 5. Write Recovery Program summary report.

FY06 Task 5		
Labor-	Work days	Cost
Project Leader (438/day)	6	$2,628
Biologist (340/day)	8	$2,720

Technician (195/day)		$0
FY06 Task 5 Subtotal		$5,348

FY 2006 Total	$51,667

FY-2007 Work

- Deliverables/Due Dates

Project annual report November 2007

Budget by Task:

Task 1. Literature research, order and Prepare equipment.

FY07 Task 1		
Labor-	Work days	Cost
Project Leader (451/day)	1	$451
Biologist (350/day)	4	$1,400
Technician (201/day)	5	$1,005
FY07 Task 1 Subtotal		$2,856

Task 2. Scout locations, final equipment preparation.

FY07 Task 2		
Labor-	Work days	Cost
Project Leader (451/day)	4	$1,804
Biologist (350/day)	4	$1,400
Technician (201/day)	4	$804
Travel		
Vehicle ($36/day; mileage and rent) [a]	4	$144
Equipment (maintenance or replacement)[b]		$1,000
FY07 Task 2 Subtotal		$5,152

[a] Calculated as average miles traveled per day * cost per mile + daily rental fee = 75 * $0.41 + $5 = $35.75/day.

[b] Includes repair or replacement of outboard motor lower units, electrofishing, and trammel net repair and replacement.

Task 3. 3-pass sampling.

FY07 Task 3		
Labor-	Work days	Cost
Project Leader (451/day)	10	$4,510
Biologist (350/day)	40	$14,000
Technician (201/day)	80	$16,080
Travel		
Vehicle ($36/day; mileage and rent)[a]	20	$720
Equipment (maintenance or replacement)[b]		$1,000
FY07 Task 3 Subtotal		$36,310

[a] Calculated as average miles traveled per day * cost per mile + daily rental fee = 75 * $0.41 + $5 = $35.75/day.

[b] Includes repair or replacement of outboard motor lower units, electrofishing, and trammel net repair and replacement.

Task. 4 Sampling team coordination, data entry and analysis.

FY07 Task 4		
Labor-	Work days	Cost
Project Leader (451/day)	5	$2,255
Biologist (350/day)	3	$1,050
Technician (201/day)		$0
FY07 Task 4 Subtotal		$3,305

Task 5. Write Recovery Program summary report.

FY07 Task 5		
Labor-	Work days	Cost
Project Leader (451/day)	6	$2,706
Biologist (350/day)	8	$2,800

Technician (201/day)		$0
FY07 Task 5 Subtotal		$5,506

FY 2007 Total	$53,129

White River, U. S. Fish and Wildlife Service, Vernal

SOW 128 **FY2006** - White River, U.S. Fish and Wildlife Service, CRFP, Vernal, Utah

Task Activity	Cost
Tasks 1-3	
Labor	
Trip Preparation	
GS-11 Biologist ($36.67/hr x 8 hrs/day x 6 days)	$1,760
GS-8 Fisheries Tech ($28.29/hr x 8 hrs/day x 6 Days)	$1,358
2 GS-5 Techs ($20.56/hr x 8 hrs/day x 6 days)	$1,974
Taylor Draw Dam to Rangely	
GS-11 Biologist ($36.67/hr x 8 hrs/day x 1 days/trip x 3 trips) + ($55.00/hr x 2 hrs OT x 1 day/trip x 3 trips)	$1,210
GS-8 Fisheries Tech ($28.29/hr x 8 hrs/day x 1 day/trip x 3 trips) + ($42.44/h x 2 hrs OT/day x 1 day/trip x 3 trips)	$934
2 GS-5 Tech ($20.56/hr x 8 hrs/day x 1 day/trip x 3 trips) + ($30.84/hr x 2 hrs OT/day x 1 day/trip x 3 trips)	$1,357
Rangely to State Line	
GS-11 Biologist ($36.67/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($55.00/hr x 2 hrs OT x 2 days/trip x 3 trips)	$2,420
GS-8 Fisheries Tech ($28.29/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($42.44/h x 2 hrs OT/day x 2 days/trip x 3 trips)	$1,867
2 GS-5 Tech ($20.56/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($30.84/hr x 2 hrs OT/day x 2 days/trip x 3 trips)	$2,714
State Line to Ignacio Bridge	
GS-11 Biologist ($36.67/hr x 8 hrs/day x 1 day/trip x 3 trips) + ($55.00/hr x 2 hrs OT x 1 day/trip x 3 trips)	$1,210
GS-8 Fisheries Tech ($28.29/hr x 8 hrs/day x 1 day/trip x 3 trips) + ($42.44/h x 2 hrs OT/day x 1 day/trip x 3 trips)	$934
2 GS-5 Tech ($20.56/hr x 8 hrs/day x 1 day/trip x 3 trips) + ($30.84/hr x 2 hrs OT/day x 1 day/trip x 3 trips)	$1,357
Ignacio Bridge to Enron	
GS-11 Biologist ($36.67/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($55.00/hr x 2 hrs OT x 2 days/trip x 3 trips)	$2,420
GS-8 Fisheries Tech ($28.29/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($42.44/h x 2 hrs OT/day x 2 days/trip x 3 trips)	$1,867
2 GS-5 Tech ($20.56/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($30.84/hr x 2 hrs OT/day x 2 days/trip x 3 trips)	$2,714
Enron to White River mouth	
GS-11 Biologist ($36.67/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($55.00/hr x 2 hrs OT x 2 days/trip x 3 trips)	$2,420
GS-8 Fisheries Tech ($28.29/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($42.44/h x 2 hrs OT/day x 2 days/trip x 3 trips)	$1,867
2 GS-5 Tech ($20.56/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($30.84/hr x 2 hrs OT/day x 2 days/trip x 3 trips)	$2,714

Subtotal	$33,097

Travel, Per Diem, Equipment	
Vernal to Taylor Draw Dam round trip	
(3 trucks/trip x 120 mi/truck x $0.405/mi x 3 trips)	$437
Taylor Draw Dam to Rangely	
Boat gas (6 gal gas/boat x $2.50/gal x 2 boats/day x 1 day/trip x 3 trips)	$90
Boat oil (1 qt. Oil/boat x $2.75/qt x 2 boats/day x 1 day/trip x 3 trips)	$17
Vernal to Rangely to Stateline round trip	
(3 trucks/trip x 175 mi/truck x $0.405/mi x 3 trips)	$638
Shuttle Drivers (3 drivers/trip x $100/driver x 3 trips)	$900
Shuttle Driver Organizer (1 driver/trip x $10/driver x 3 trips) for trip organization	$30
Rangely to Stateline	
Boat gas (12 gal gas/boat x $2.50/gal x 2 boats/day x 2 days/trip x 3 trips)	$360
Boat oil (2 qts. Oil/boat x $2.75/qt x 2 boats/day x 2 days/trip x 3 trips)	$66
Per diem (4 people/day x $25/person x 2 days/trip x 3 trips)	$600
Vernal, to "Stateline to Igancio Bridge round trip	
(3 trucks/trip x 125 mi/truck x $0.405/mi x 3 trips)	$456
Shuttle Drivers (3 drivers/trip x $100/driver x 3 trips)	$900
Shuttle Driver Organizer (1 driver/trip x $10/driver x 3 trips) for trip organization	$30
Stateline to Igancio Bridge	
Boat gas (6 gal gas/boat x $2.50/gal x 3 boats/day x 1 day/trip x 3 trips)	$135
Boat oil (1 qts. Oil/boat x $2.75/qt x 3 boats/day x 1 day/trip x 3 trips)	$25
Vernal, Igancio Bridge to Enron round trip	
(4 trucks/trip x 180 mi/truck x $0.405/mi x 3 trips)	$875
Shuttle Drivers (4 drivers/trip x $100/driver x 3 trips)	$1,200
Shuttle Driver Organizer (1 driver/trip x $10/driver x 3 trips) for trip organization	$30
Igancio Bridge to Enron	
Boat gas (6 gal gas/boat x $2.50/gal x 3 boats/day x 2 days/trip x 3 trips)	$270
Boat oil (1 qts. Oil/boat x $2.75/qt x 3 boats/day x 2 days/trip x 3 trips)	$50
Per diem (5 people/day x $25/person x 2 days/trip x 3 trips)	$750
Verna to Enron to White River mouth round trip	
(4 trucks/trip x 180 mi/truck x $0.405/mi x 3 trips)	$875
Shuttle Drivers (4 drivers/trip x $100/driver x 3 trips)	$1,200
Shuttle Driver Organizer (1 driver/trip x $10/driver x 3 trips) for trip organization	$30
Enron to White River mouth	
Boat gas (6 gal gas/boat x $2.50/gal x 3 boats/day x 2 days/trip x 3 trips)	$270
Boat oil (1 qts. Oil/boat x $2.75/qt x 3 boats/day x 2 days/trip x 3 trips)	$50
Per diem (5 people/day x $25/person x 2 days/trip x 3 trips)	$750
Equipment and supplies (nets, electrofishing gear, maintenance and repairs, boat motors, Garmin ETrex vista Cx Expandable Color hand held GPS Receivers [2@$350 each], etc.)	$9,480

Subtotal	$20,514

Total	$53,611

SOW 128 **FY2007** - White River, U.S. Fish and Wildlife Service, CRFP, Vernal, Utah

Task Activity	Cost
Tasks 1-4	
Labor	
Trip Preparation	
GS-11 Biologist ($37.77/hr x 8 hrs/day x 6 days)	$1,813
GS-8 Fisheries Tech ($29.14/hr x 8 hrs/day x 6 Days)	$1,399
2 GS-5 Techs ($21.18/hr x 8 hrs/day x 6 days)	$2,033
Taylor Draw Dam to Rangely	
GS-11 Biologist ($37.77/hr x 8 hrs/day x 1 days/trip x 3 trips) + ($56.65/hr x 2 hrs OT x 1 day/trip x 3 trips)	$1,246
GS-8 Fisheries Tech ($29.14/hr x 8 hrs/day x 1 day/trip x 3 trips) + ($44.71/h x 2 hrs OT/day x 1 day/trip x 3 trips)	$961
2 GS-5 Tech ($21.18/hr x 8 hrs/day x 1 day/trip x 3 trips) + ($31.77/hr x 2 hrs OT/day x 1 day/trip x 3 trips)	$1,398
Rangely to State Line	
GS-11 Biologist ($37.77/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($56.65/hr x 2 hrs OT x 2 days/trip x 3 trips)	$2,493
GS-8 Fisheries Tech ($29.14/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($44.71/h x 2 hrs OT/day x 2 days/trip x 3 trips)	$1,924
2 GS-5 Tech ($21.18/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($31.77/hr x 2 hrs OT/day x 2 days/trip x 3 trips)	$2,795
State Line to Ignacio	
GS-11 Biologist ($37.77/hr x 8 hrs/day x 1 day/trip x 3 trips) + ($56.65/hr x 2 hrs OT x 1 day/trip x 3 trips)	$1,246
GS-8 Fisheries Tech ($29.14/hr x 8 hrs/day x 1 day/trip x 3 trips) + ($44.71/h x 2 hrs OT/day x 1 day/trip x 3 trips)	$961
2 GS-5 Tech ($21.18/hr x 8 hrs/day x 1 day/trip x 3 trips) + ($31.77/hr x 2 hrs OT/day x 1 day/trip x 3 trips)	$1,398
Ignacio to Enron	
GS-11 Biologist ($37.77/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($56.65/hr x 2 hrs OT x 2 days/trip x 3 trips)	$2,493
GS-8 Fisheries Tech ($29.14/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($44.71/h x 2 hrs OT/day x 2 days/trip x 3 trips)	$1,924
2 GS-5 Tech ($21.18/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($31.77/hr x 2 hrs OT/day x 2 days/trip x 3 trips)	$2,795
Enron to White River mouth	
GS-11 Biologist ($37.77/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($56.65/hr x 2 hrs OT x 2 days/trip x 3 trips)	$2,493
GS-8 Fisheries Tech ($29.14/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($44.71/h x 2 hrs OT/day x 2 days/trip x 3 trips)	$1,924
2 GS-5 Tech ($21.18/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($31.77/hr x 2 hrs OT/day x 2 days/trip x 3 trips)	$2,796

Subtotal	$34,091

Travel, Per Diem, Equipment	
Vernal to Taylor Draw Dam round trip	
(3 trucks/trip x 120 mi/truck x $0.417/mi x 3 trips)	$450
Taylor Draw Dam to Rangely	
Boat gas (6 gal gas/boat x $2.58/gal x 2 boats/day x 1 day/trip x 3 trips)	$93
Boat oil (1 qt. Oil/boat x $2.83/qt x 2 boats/day x 1 day/trip x 3 trips)	$17
Vernal to Rangely to Stateline round trip	
(3 trucks/trip x 175 mi/truck x $0.417/mi x 3 trips)	$657

Shuttle Drivers (3 drivers/trip x $103/driver x 3 trips)	$927
Shuttle Driver Organizer (1 driver/trip x $11/driver x 3 trips) for trip organization	$33
Rangely to Stateline	
Boat gas (12 gal gas/boat x $2.58/gal x 2 boats/day x 2 days/trip x 3 trips)	$372
Boat oil (2 qts. Oil/boat x $2.83/qt x 2 boats/day x 2 days/trip x 3 trips)	$68
Per diem (4 people/day x $26/person x 2 days/trip x 3 trips)	$624
Vernal to Stateline to Igancio Bridge round trip	
(3 trucks/trip x 125 mi/truck x $0.417/mi x 3 trips)	$469
Shuttle Drivers (3 drivers/trip x $103/driver x 3 trips)	$927
Shuttle Driver Organizer (1 driver/trip x $11/driver x 3 trips) for trip organization	$33
Stateline to Ignacio Bridge	
Boat gas (6 gal gas/boat x $2.58/gal x 3 boats/day x 1 day/trip x 3 trips)	$139
Boat oil (1 qts. Oil/boat x $2.83/qt x 3 boats/day x 1 day/trip x 3 trips)	$25
Vernal to Ignaico Bridge to Enron round trip	
(4 trucks/trip x 180 mi/truck x $0.417/mi x 3 trips)	$901
Shuttle Drivers (4 drivers/trip x $103/driver x 3 trips)	$1,236
Shuttle Driver Organizer (1 driver/trip x $11/driver x 3 trips) for trip organization	$33
Igancio Bridge to Enron	
Boat gas (6 gal gas/boat x $2.58/gal x 3 boats/day x 2 days/trip x 3 trips)	$279
Boat oil (1 qts. Oil/boat x $2.83/qt x 3 boats/day x 2 days/trip x 3 trips)	$51
Per diem (5 people/day x $26/person x 2 days/trip x 3 trips)	$780
Vernal to Enron to White River mouth	
(4 trucks/trip x 180 mi/truck x $0.417/mi x 3 trips)	$901
Shuttle Drivers (4 drivers/trip x $103/driver x 3 trips)	$1,236
Shuttle Driver Organizer (1 driver/trip x $11/driver x 3 trips) for trip organization	$33
Enron to White River mouth	
Boat gas (6 gal gas/boat x $2.58/gal x 3 boats/day x 2 days/trip x 3 trips)	$279
Boat oil (1 qts. Oil/boat x $2.83/qt x 3 boats/day x 2 days/trip x 3 trips)	$51
Per diem (5 people/day x $26/person x 2 days/trip x 3 trips)	$780
Equipment and supplies (nets, electrofishing gear, maintenance and repairs, boat motors, etc.)	$9,015

Subtotal	$20,409

Total	$54,500

Desolation-Gray Canyon, Green River, U. S. Fish and Wildlife Service, Vernal

SOW 128 **FY2006** - Desolation-Gray Canyon, Green River, U.S. Fish and Wildlife Service, CRFP, Vernal, Utah

Task Activity	Cost

Tasks 1-4

Labor	
2 GS-11 Biologist trip prep ($36.67/hr x 8 hrs/day x 3 days) Ouray to Sandwash	$1,760
3 GS-5 Techs trip prep ($20.56/hr x 8 hrs/day x 6 days) Ouray to Sandwash	$2,961
2 GS-11 Biologist ($36.67/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($55.00/hr x 2 hrs OT x 2 days/trip x 3 trips)	$4,840
3 GS-5 Tech ($20.56/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($30.84/hr x 2 hrs OT/day x 2 days/trip x 3 trips)	$4,071
2 GS-11 Biologist trip prep ($36.67/hr x 8 hrs/day x 3 days) Sandwash to Swaesys	$1,760
3 GS-5 Techs trip prep ($20.56/hr x 8 hrs/day x 6 days) Sandwash to Swaesys	$2,961
2 GS-11 Biologist ($36.67/hr x 8 hrs/day x 5 days/trip x 3 trips) + ($55.00/hr x 2 hrs OT x 5 days/trip x 3 trips)	$12,101
3 GS-5 Tech ($20.56/hr x 8 hrs/day x 5 days/trip x 3 trips) + ($30.84/hr x 2 hrs OT/day x 5 days/trip x 3 trips)	$10,178

Subtotal	$40,632

Travel, Per Diem, Equipment	
Vernal to Ouray round trip	
(4 trucks/trip x 75 mi/truck x $0.405/mi x 3 trips)	$365
Shuttle Drivers (4 drivers/trip x $60/driver x 3 trips)	$720
Shuttle Driver Organizer (1 driver/trip x $10/driver x 3 trips) for trip organization	$30
Ouray to Sandwash	
Boat gas (12 gal gas/boat x $2.50/gal x 3 boats/day x 2 days/trip x 3 trips)	$540
Boat oil (2 qts. Oil/boat x $2.75/qt x 3 boats/day x 2 days/trip x 3 trips)	$99
Per diem (5 people/day x $25/person x 2 days/trip x 3 trips)	$750
Vernal to Sandwash round trip	
(4 trucks/trip x 175 mi/truck x $0.405/mi x 3 trips)	$851
Shuttle Drivers (4 drivers/trip x $100/driver x 3 trips)	$1,200
Shuttle Driver Organizer (1 driver/trip x $10/driver x 3 trips) for trip organization	$30
Sandwash to Swaesys	
Boat gas (6 gal gas/boat x $2.50/gal x 3 boats/day x 5 days/trip x 3 trips)	$675
Boat oil (1 qts. Oil/boat x $2.75/qt x 3 boats/day x 5 days/trip x 3 trips)	$124
Per diem (5 people/day x $25/person x 5 days/trip x 3 trips)	$1,875
Vernal to Swaeseys round trip	
(4 trucks/trip x 400 mi/truck x $0.405/mi x 3 trips)	$1,944
Shuttle Drivers (4 drivers/trip x $100/driver x 3 trips)	$1,200
Shuttle Driver Organizer (1 driver/trip x $10/driver x 3 trips) for trip organization	$30
Equipment and supplies (nets, electrofishing gear, maintenance and repairs, boat motors, Garmin ETrex vista Cx Expandable Color hand held GPS Receivers [2@$350 each], etc.)	$13,614

Subtotal	$24,047

Total	$64,679

SOW 128 **FY2007** - Desolation-Gray Canyon, Green River, U.S. Fish and Wildlife Service, CRFP, Vernal, Utah

Task Activity	Cost
Tasks 1-4	
Labor	
2 GS-11 Biologist trip prep ($37.77/hr x 8 hrs/day x 3 days) Ouray to Sandwash	$1,813
3 GS-5 Techs trip prep ($21.18/hr x 8 hrs/day x 6 days) Ouray to Sandwash	$3,050
2 GS-11 Biologist ($37.77/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($56.65/hr x 2 hrs OT x 2 days/trip x 3 trips)	$4,986
3 GS-5 Tech ($21.18/hr x 8 hrs/day x 2 days/trip x 3 trips) + ($31.77/hr x 2 hrs OT/day x 2 days/trip x 3 trips)	$4,194
2 GS-11 Biologist trip prep ($37.77/hr x 8 hrs/day x 3 days) Sandwash to Swaesys	$1,813
3 GS-5 Techs trip prep ($21.18/hr x 8 hrs/day x 6 days) Sandwash to Swaesys	$3,050
2 GS-11 Biologist ($37.77/hr x 8 hrs/day x 5 days/trip x 3 trips) + ($56.65/hr x 2 hrs OT x 5 days/trip x 3 trips)	$12,464
3 GS-5 Tech ($21.18/hr x 8 hrs/day x 5 days/trip x 3 trips) + ($31.77/hr x 2 hrs OT/day x 5 days/trip x 3 trips)	$10,484

Subtotal	$41,854

Travel, Per Diem, Equipment	
Vernal to Ouray round trip	
(4 trucks/trip x 75 mi/truck x $0.417/mi x 3 trips)	$375
Shuttle Drivers (4 drivers/trip x $62/driver x 3 trips)	$744
Shuttle Driver Organizer (1 driver/trip x $11/driver x 3 trips) for trip organization	$33
Ouray to Sandwash	
Boat gas (12 gal gas/boat x $2.58/gal x 3 boats/day x 2 days/trip x 3 trips)	$557
Boat oil (2 qts. Oil/boat x $2.83/qt x 3 boats/day x 2 days/trip x 3 trips)	$102
Per diem (5 people/day x $26/person x 2 days/trip x 3 trips)	$780
Vernal to Sandwash round trip	
(4 trucks/trip x 175 mi/truck x $0.417/mi x 3 trips)	$876
Shuttle Drivers (4 drivers/trip x $103/driver x 3 trips)	$1,236
Shuttle Driver Organizer (1 driver/trip x $11/driver x 3 trips) for trip organization	$33
Sandwash to Swaesys	
Boat gas (6 gal gas/boat x $2.58/gal x 3 boats/day x 5 days/trip x 3 trips)	$697
Boat oil (1 qts. Oil/boat x $2.83/qt x 3 boats/day x 5 days/trip x 3 trips)	$127
Per diem (5 people/day x $26/person x 5 days/trip x 3 trips)	$1,950
Vernal to Swaesys round trip	
(4 trucks/trip x 400 mi/truck x $0.417/mi x 3 trips)	$2,002
Shuttle Drivers (4 drivers/trip x $103/driver x 3 trips)	$1,236

Shuttle Driver Organizer (1 driver/trip x $11/driver x 3 trips) for trip organization	$33
Equipment and supplies (nets, electrofishing gear, maintenance and repairs, boat motors, etc.)	$13,263

Subtotal	$24,044

Total	$65,898

lower Green River, Utah Division of Wildlife Resources, Moab

FY2006 Work:

Task 1-3. Three mark-recapture passes. Each pass is broken into two trips; from Green River to Mineral Bottom and from Mineral Bottom to the confluence with the Colorado River.

Personnel:			
	Project Leader ($36.52/hr x 10hr/d for 20 person-days)	$	7,304
	2 Biologists ($28.38/hr x 10hr/d for 140 person days)	$	39,732
	5 Technicians ($16.19hr x 10hr/d for 300 person days)	$	48,570
	Subtotal	**$**	**95,606**
Travel / Per Diem:			
	Mileage: (5) trucks - 180 mi per pass @ $.42 per mi for 3 passes, $5/day/truck for 2 mos.	$	4,750
	Gas (boats and generator) for 3 passes;	$	1,200
	Per Diem: - 7 people @ $15 per day for 30 days;	$	3,150
	Subtotal	**$**	**9,100**
Equipment / Supplies:			
	Equipment Repair and Replacement (replace two 30 hp outboards, 1 trailer)	$	6,000
	Miscellaneous: camping equipment (tents, dry bags, stoves, cookware, chairs, tables, toilets, life jackets, dip nets, GPS units, scales)	$	2,000
	Subtotal	**$**	**8,000**
FY 06 TOTAL		**$**	**112,706**

FY2007 Work:

Task 1-3. Three mark-recapture passes. Each pass is broken into two trips; from Green River to Mineral Bottom and from Mineral Bottom to the confluence with the Colorado River.

Personnel:

Project Leader ($37.61/hr x 10hr/day x 20 total work days)	$	7,522
2 Biologists ($29.24/hr x 10hr/day x 140 total work days)	$	40,936
5 Technicians ($16.67/hr x 10hr/day x 300 total work days)	$	50,010
Subtotal	**$**	**98,468**

Travel / Per Diem:

Mileage: (5) trucks - 180 mi per pass @ $.42 per mi for 3 passes, $5/day/truck for 2 mos.	$	4,750
Gas (boats and generator) for 3 passes;	$	1,200
Per Diem: - 7 people @ $15 per day for 30 days;	$	3,150
Subtotal	**$**	**9,100**

Equipment / Supplies:

Equipment Repair and Replacement (maintain outboards, trailer repairs, generators, replace 2 Jon boats,)	$	6,000
Miscellaneous: camping equipment (tents, dry bags, stoves, cookware, chairs, tables, toilets, life jackets, dip nets, GPS units, scales)	$	2,000
Subtotal	**$**	**8,000**
FY 07 TOTAL	**$**	**115,568**

FY2008 Work:

Budget: $118,522 (includes 3% annual cost of living increase for personal services).

IX. Budget Summary

FY-2006	$336,473
FY-2007	$345,711
Total:	$682,184

X. Reviewers: Dr. Richard Valdez, Dr. Paul Holden, Doug Osmundson

XI. References

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